Title: Shaping Up- Exploring the Attributes of Shapes all Around Us

Brief Overview:

Students are reintroduced to shapes through a read-aloud. Integrating mathematics and literacy will not only engage students but also allow students to develop an understanding of the place of mathematics in their world.

Student will use shape models to compare shapes and work together to identify shapes in their classroom, school, and home. This lesson also provides students the opportunity to reflect in writing on the shape-hunting process. Students of various learning styles will become engaged throughout the lesson (visual, spatial, and total physical response). In the following lesson students will identify and analyze two-dimensional shapes and develop vocabulary to describe the attributes of two-dimensional shapes.

NCTM Content Standard/National Science Education Standard:
Lesson One:
- Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Lesson Two
- Recognize, name, build, draw, compare, and sort two- and three-dimensional shapes
- Describe attributes and parts of two- and three- dimensional shapes
- Investigate and predict the results of putting together and taking apart two- and three-dimensional shapes

Lesson Three
- Describe attributes and parts of two- and three- dimensional shapes
- Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another

Grade/Level:

1-2/On-level

Duration/Length:

3 to 4 class periods, 60 minutes

Student Outcomes:

Lesson One
Students will:

- Recognize shapes in their environment through reading.
- Classify (compare and contrast) shapes by sorting.
- Describe the attributes of various shapes by working cooperatively.
- Develop literacy and critical-thinking skills by using words and /or pictures to describe the location of shapes.

Lesson Two
Students will:

- Identify attributes of 2- dimensional shapes using tangram shapes

Lesson Three
Students will:

- Sort 2- dimensional shapes by a similar attribute using a Venn Diagram
- Create patterns of 2-dimensional shapes using pattern blocks

Materials and Resources:

Lesson One
- Shape patterns
- Post-it notes
- Classroom objects of various shapes
- Sorting Mat (for shape patterns)
- KWL (chart paper)
- Math Journal

Lesson Two
- Tangrams (1 set of 7 pieces per each student)
- 1 copy of the book Three Pigs, One Wolf, Seven Magic Shapes by Grace Maccarone ISBN: 0590308572

Lesson Three
- Various pattern blocks (For example: 10 hexagon, 12 trapezoid, 15 triangle, 15 rhombus, 20 square, 15 parallelogram, 10 triangles) for teacher use in demonstration.
Note: Teacher should put magnets or tape on the back of the pattern blocks to use to attach to the board during the demonstration.
- 1 copy of the book Twizzlers: Shapes and Patterns by Jerry Pallotta ISBN: 0439340535

- 1 dry erase board per each student
- 1 dry erase marker per each student
- 1 quart size bag filled with pattern blocks (1 bag for a pair of students-Two students will share one bag)

Development/Procedures:

Lesson 1

Pre-assessment

Students have learned to recognize and identify shapes in the first grade. To recall student's knowledge of shapes gather students in a large group on the carpet. Place shape patterns in front of the students and ask them to name various shapes (square, rectangle, etc.). To fully engage students in the lesson, offer several questions:

- **Why do we call this shape a square?**
- **What makes this shape a triangle?**
- **Are shapes all around us?**
- **What do you know about shapes?**

Using a KWL chart list student responses on what they know about shapes. If students are unable to answer questions list the questions on the KWL as well. Any questions generated by the students should be added to the KWL throughout the class discussion.

Launch

Introduce the concept of geometric shapes by reading <u>Shapes, Shapes, Shapes</u> by Tonya Hoban or <u>Shape Space</u> by Cathryn Falwell (additional literature can be found in Teacher Resource 1). The first book allows students to see shapes in the world around them. From a lunch box to a hard-boiled egg, students identify shapes found in everyday objects. In the second text, a young gymnast dances her way through various shapes.

Pause during the read aloud only to allow students to answer any questions they have listed on the KWL.

Teacher Facilitation

Following the read-aloud ask students to list any answers discovered about shapes on the KWL. This is also a time for students to list any questions that arose during the read-aloud.

Using chart paper list all the shapes recognized in the read aloud. Give each student a sticky note (written with one shape, square, triangle, circle etc.) Allow students to find an object in the classroom, which is an example of the shape written on their post-it (2-5 minutes). [**Teacher Note:** Please provide enough objects in your classroom for every child to discover.] After students have discovered various shapes around the classroom, call students back to the carpet and post responses on the chart paper.

Continue to inform students that shapes are all around us and lead students into investigating the concept: **We know that shapes are all around us, but why do shapes differ?**

Student Application

Distribute various shape patterns to pairs of students. Ask students to sort shapes into categories. Encourage students to reflect on their shape sorting process by responding to the following question in their math journal: How did you sort your shapes?

Teacher Note- Some students may not know where to begin. To assist students with sorting, think of these possible questions:
- Do you see any way that any shapes are different or alike?
- How does this square compare with the other shapes?

Other students may only compare one or two attributes. Challenge these students to find more characteristics, by asking, "Are there other ways these shapes are alike and different? How can you describe each of the shapes?

Embedded Assessment

Circulate around the classroom to evaluate student's shape sorting. Did the student identify ways the shapes are alike and different? Does their journal reflection show the ways their shapes are alike and different? Following student reflections on their sorting process gather students on the carpet to discuss their findings.

Possible questions for discussion-
- How did you sort your shapes? How are they alike?
- What did you do first, second, and so on in your shape sorting process?
- How are the shapes different?
- Who can find two shapes that are different in only one way?

Reteaching/Extension

To assure students comprehension of shape similarities and differences review all shapes with students by reading shape poems (Student Resource 1). While reading each shape poem allow students to recognize shape attributes by touching the edges and equal sides among various shapes. Act as a "model" by pointing out the attributes of these shapes.
Have students glue the shape poems in their math journals. As a lesson closure students will list everyday objects (outside of classroom) that are various shapes in their math journals. This is a great way to prepare students for their homework (Student Resource 3-Shape Shuttle).

While closing the lesson describe a shape in the classroom listing its attributes. Allow students to identify the object and its shape based on the clues given.

To prepare for the final assessment (Student Resource 13), students may complete the exit tickets on Student Resource 2. See Teacher Resource 2 for answers.
Extension: Students may compose their own shape poems that relate to objects in the classroom.

Examples-
- You seem to glance at me everyday. I have four edges that help me stand tall. Two of them are wide and two of them are small.
  I am _____ (rectangle/window).

- Just call me your resting pad. When you're tired I'm whom you use to rest your head. I can hold you up, because my edges are all the same. Four in all, _____ is my name. (square/desk)

Lesson 2

Pre-assessment - What do students know about attributes of two-dimensional shapes?

Teacher and students play I- Spy to review the concept of attributes from Lesson 1.

To begin, say to the students, "Today we will play a game. Our game is I- Spy. In this game, I will look around the room and describe objects that I see in the room. It is the class's job to use the clues I give to figure out what my object is. There are a few rules to this game. First, I must use math attribute words to describe the objects and tell about how we use the object in school. Second, the object needs to be visible to everyone in this room. Third, when I start giving the clues about the objects, I need to say, "I spy with my little eye." Fourth, when we

give the answer, we need to state the object and say what shape the object is. Last, we need to have fun playing the game. Now, before we begin, does everyone remember the math attribute words that we learned yesterday to describe shapes?"

Possible student responses are number of sides, number of vertices, number of angles, or types of angles.

Record students' responses on the board.

Launch – Play I-Spy

You and the students will play I-Spy. An example of how the game's procedure is as follows:

Say, "Class, I spy with my little eye something that has 4 equal sides. It has 4 right angles, and we use it so that we have something to write on and store our school supplies. What object is it?"

Students respond "Desk."

Ask students, "What shape is the desk?"

Students respond, "It is a square."

Say, "Class, I spy with my little eye something that 4 sides and 4 right angles, but this time, the shape has two long sides and two short sides. We use this object to give us a view of the beautiful outside world. What object is it?"

Students respond "Window."

Ask students, "What shape is the window?"

Students respond, "It is a rectangle."

Continue to play I-Spy. After the teacher has modeled adequately how to play the game (Teacher has given clues for approximately 3 objects). Teacher asks students to think of their own clues to describe shapes in the room. Teacher asks for student volunteers to share their I-Spy clues.

One possible student response is: "I spy with my little eye something that is round. It has no sides and we use it to tell us what time we are suppose to go to lunch."

Response would be "Clock. It is a circle."

After 2 to 3 students have shared their I-Spy clues with the class, tell students, "Now, I am going to show you a picture and I would like you to tell me what shapes you spy in the picture."

Show students Teacher Resource 3 Tangram Foxes.

Ask, "What shapes do you spy in this picture?"

Students respond triangles, square, and parallelogram.

Ask, "What big picture do all the shapes make up?"

Students respond a fox.

Ask, "Does anyone spy shapes inside of objects in our classroom?"

Students respond with vary. Some examples are: A square has two triangles in it. A hexagon has two trapezoids in it.

Teacher Facilitation-   Three Pigs, One Wolf, Seven Magic Shapes.

Say to class, "Shapes are all around us. Have you ever looked at objects and seen many different shapes inside of the object? Yesterday, we used pattern blocks to sort shapes by similar attributes. Now, I want us to identify those pattern block shapes inside of other shapes."

Say to students, "Today, I am going to read a story called Three Pigs, One Wolf, Seven Magic Shapes."

Show the cover to class. Ask the students, "What do you notice about the cover of the book?"

*Students might respond: (the title, the picture of the pig, etc.) Guide the students to look at the picture made from the 7 shapes (5 triangles, 1 parallelogram, and 1 square) on the cover of the book.

Ask, "What objects do these shapes together make up?"

Students respond a wolf.

Say, "This is a story that some of you might have heard before, but this book puts a new twist on it. We are going to read the story and look for the ways that they create objects using other shapes. I'm also going to give you your own shapes so you can make pictures like those in the book. Yesterday, we used pattern block 2-D shapes. Today, we will use the tangram shapes to make larger objects."

Distribute Student Resources 4 to the class. Tell the class that they will need to cut out the 5 triangles, 1 parallelogram, and 1 square on the paper.

Ask the class, "What are the attributes of the shapes you just cut out?"
*Possible student responses
triangle- It is 3 sided. It has 3 angles inside of it.
square- It has 4 sides. The sides are equal.

Read the story aloud to the class. Stop at the different parts of the story where there are pictures using the tangrams. Ask students to create the pictures in the book using their own tangram shapes.

Student Application

Tell students, "Now, it's your chance to make objects using different shapes."

Ask students to create an object (it could be an animal, a person, or anything they want) with the tangrams.

Allow time for students to use the tangrams to design a picture of an object.

Tell students that they will be divided into groups of 2 (pairs). Tell the students that they need to show their pictures to their partners.   They will ask their partners:

- What do you think I made a picture of?
- What shapes do you see in my picture?
- Pick any shape. Tell me two attributes for that shape.

Tell students that they need to check their partner's answers to make sure they are correct.

After each partner pair has shared their picture and asked their questions, distribute Student Resources 5 and 6 to each student in the class.

Students complete the Student Resources 5 and 6. See Teacher Resources 4 and 5 for answers.

Embedded Assessment

Students complete the Student Resource 6.   It is a BCR in which they identify 2-dimensional shapes and list attributes for 2-dimesional shape. Students complete the assessment independently. See Teacher Resource 5 for answers.


Reteaching/Extension

Some students might need reteaching of 2-D shapes and attributes. For those students, gather a small group of students and together to complete Student Resource 7. See Teacher Resource 6 for answers.

Some student might need an extension for the activity. For those students, gather a small group of students and review the directions for Student Resource 8. After reviewing the directions with students, instruct them to complete the paper independently. See Teacher Resource 7 for answers.

Lesson 3

Pre-assessment- What do students know about categorizing and sorting 2-dimensional shapes?

Before the lesson, hang or draw a Venn Diagram on the board. Place pattern block shapes (a hexagon, square, rhombus, triangle, trapezoid, and a parallelogram) outside of the circles. Label the rules for the circles.

Have 3 or more vertices	Have 4 equal sides
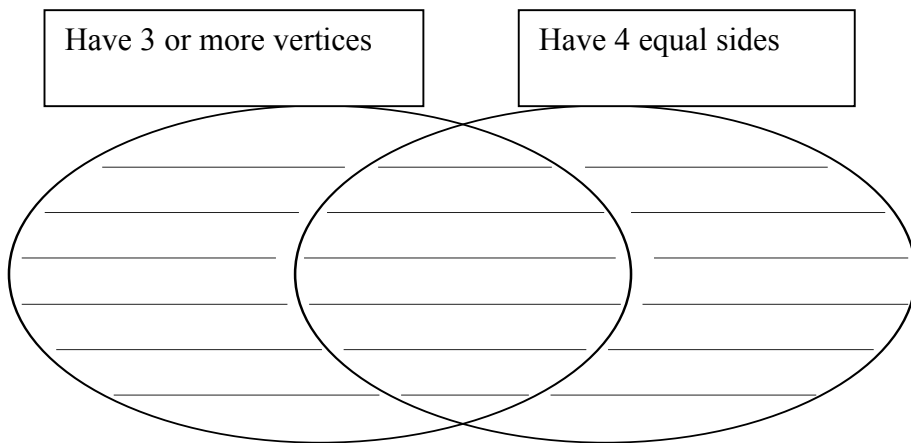
When the lesson beginnings, tell the class, "This is a Venn Diagram. I would like you to sort the shapes outside of the circle by a similar attribute. Let's talk about how we sort shapes on the Venn Diagram. If I pick up a pattern block that has 5 vertices, where would I put it? Wait for students' responses. Say, "I would place it in the circle that says has 3 or more vertices."

Say, "Look at the square. Where would I put it?" Wait for student responses. Say, "I picked up a shape that has 4 equal sides, I would place the shape into the second circle, but if I have a shape that has both 4 equal sides AND 3 or more vertices, I place the shapes into the center of the two circles. This shape fits both rules." Students direct you to place the remaining shapes on the Venn Diagram.

As a class, sort the shapes.

ANSWER KEY:

Shapes that have 3 or more vertices:

Hexagon, trapezoid, triangle

Shapes that have 4 equal sides:

There are no shapes that just have 4 equal sides and do not have 3 or more vertices.

Shapes that fit both rules:

Rhombus, parallelogram, square

Teacher and class discuss the results.

Launch

Say to class, "Today, we are going to continue our discussion on attributes of 2-dimensioanl shapes, but now we are going to talk about making attribute patterns with our 2-D shapes. Today, we will read the story, <u>Twizzlers: Shapes and Patterns</u>. While I am reading this story, I want you to think about attribute words used in the book and patterns in the story. While we are reading, we will create a T-Chart listing the attribute words we learned and the patterns we see. Raise your hand when you hear an attribute word or see a pattern that you would like us to write in our chart."

Write this chart on the board

Attribute Words	Patterns We Found

Read aloud the story and stops when student volunteers raise their hands.

An example of what the chart might look like after reading the story:

Attribute Words	Patterns We Found
- Has right angles	- 1 red Twizzler, 1 blue triangle, 1 black Twizzler, 1 red Twizzler, 1 blue triangle, 1

- Has three sides and 3 angles - Has curved lines - Has equal sides	black Twizzler - 1 black Twizzler, 2 red Twizzlers, 1 black Twizzler, 2 red Twizzlers -1 black Twizzler, 1 red Twizzler, 1 black Twizzler, 2 red Twizzlers, 1 black Twizzler, 3 red Twizzlers

After reading the story, discuss the chart with the class. Some questions to ask are as follows:

- What new attribute words did you learn today?
- Could anyone think of a pattern using the Twizzlers that was not mentioned in the book?
- (Using a pattern block from the pre-assessment) Which of the attribute words in the book could I use to describe this shape?

Teacher Facilitation

After reading the story, tell the class that today they are going to make their own attribute patterns.

Place various patterns blocks on the board. For example, there could be 5 squares, 10 triangles, 4 hexagons, 8 parallelograms, 10 rhombi, and 5 trapezoids.

For the first demonstration, place 2 triangles, 2 hexagons, 2 triangles, 2 hexagons on the board.

Say to the class, "Look up at the board. I have created a pattern using my pattern blocks. Can anyone tell us what shapes would come next in my pattern?"

* Students respond 2 triangles.*

Say to class, "What comes after the 2 triangles?"

* *Students respond 2 hexagons.*

Ask the class, "Can anyone think of attribute words to describe the triangle?"

* *Student responses will vary. Some examples of responses could be: 3 sides, 3 vertices, 3 equal sides, or symmetrical.*

Ask the class, "Can anyone think of attribute words to describe the hexagon?"

* *Student responses will vary. Some examples of responses could be: 6 sides, 6 vertices, 6 equal sides, or symmetrical.*

Say to the students, "Now, using our attribute words, can anyone tell me what the rule of the pattern is? Remember, you must use your attribute words!"

* Student responses will vary. Possible response could be:
- 3 sided shape, 3 sided shape, 6 sided shape, 6 sided shape, 3 sided shape, 3 sided, 6 sided shape, 6 sided shape
- shape with 3 vertices, shape with 3 vertices, shape with 6 vertices, shape with 6 vertices, shape with 3 vertices, shape with 3 vertices, shape with 6 vertices, shape with 6 vertices

Display another pattern.   The pattern will be 3 trapezoids, 2 squares, 1 parallelogram, 3 trapezoids, 2 squares, and 1 parallelogram.

Say to the class, "Look up at the board. I have created a new pattern using my pattern blocks. Can anyone tell me what shapes would come next in my pattern?"

* Students respond 3 trapezoids.

Say to class, "What comes after the 3 trapezoids?"

* Students respond 2 squares.

Say to class, "What comes after the 2 squares?"

* Students respond 1 parallelogram.

Ask the class, "Can anyone think of attribute words to describe the trapezoid?"

* Student responses will vary. Some examples of responses could be: 4 sides, 4 vertices, or symmetrical.

Ask the class, "Can anyone think of attribute words to describe the square?"

* Student responses will vary. Some examples of responses could be: 4 sides, 4 vertices, 4 equal sides, or symmetrical.

Ask the class, "Can anyone think of attribute words to describe the parallelogram?"

* Student responses will vary. Some examples of responses could be: 4 sides, 4 vertices, or has parallel sides. .

Say to the students, "Now, using our attribute words, can anyone tell me what the rule of the pattern is? Remember, you must use your attribute words! This time make sure to use attribute words that describe the specific shape. For example,

we can not just say 4 sided shape because that could mean a square OR a trapezoid"

Student responses will vary. Possible response could be:
- 4 sided shape that has only 2 equal sides, 4 sided shape that has only 2 equal sides 4 sided shape that has only 2 equal sides, 4 equal sides, 4 equal sides, 4 sided shape that has no right angles, 4 sided shape that has only 2 equal sides, 4 sided shape that has only 2 equal sides 4 sided shape that has only 2 equal sides, 4 equal sides, 4 equal sides, 4 sided shape that has no right angles

Ask for one student volunteer to create his/her own pattern on the board using the pattern blocks. Ask for another student volunteer to tell the pattern rule using the attribute words they learned today.

Student Application

Divide the class into pairs. Give each pair of students a 1-quart bag of pattern blocks. In each bag, there are various amounts of pattern blocks for each pair and the bag should be entirely filled to allow students to have the freedom to explore. Give each student a dry erase board and a marker.

Tell the class that they need to create patterns with their partner using the pattern blocks. Students may create any pattern that they want. After they create the pattern, they write the pattern rule using attribute words. They will record the pattern rule on the dry erase board. After they have written their pattern rule on the dry erase board, they need to show the pattern to their partner and explain the rule that they wrote on their dry erase board to their partner. Students need to make at least 3 patterns and share them with their partners.

Embedded Assessment

Students complete the Student Resource 9.   It is a BCR in which they will continue a pattern and explain the rule for the pattern. Students complete the assessment independently. See Teacher Resource 8 for answers.

Reteaching/Extension

At home, students complete Student Resource 10 for homework. See Teacher Resource 9 for answers.

For Reteaching:

Have a small group of students work with you on smaller patterns using the pattern blocks. For example, lay out a pattern of 1 triangle, 1 square, 1 triangle, 1 square, 1 triangle. Give each pair of students a bag of pattern blocks.   Ask the

students to create the pattern that you just modeled (1 triangle, 1 square, 1 triangle, 1 square, 1 triangle). Say to the students, "What shape do you think will come next in my pattern? Show me using your pattern blocks."

Students should respond a square.

Continue with a slightly more complicated pattern. For example, lay out a pattern of 1 triangle, 2 squares, 1 triangle, 2 squares, 1 triangle. Give pairs of students a bag of pattern blocks. Ask the students to create the pattern that you just modeled (1 triangle, 2 squares, 1 triangle, 2 squares, 1 triangle). Say to the students, "What shape do you think will come next in my pattern? Show me using your pattern blocks."

Students should respond a square.

Ask the students to create a pattern using the pattern blocks. Assign each student to a partner. After each student has created the pattern, the student then asks his or her partner, "What comes next in my pattern?" Each student needs to check their partner's answer to make sure their partner's answer is correct. Distribute Student Resource 11 to the students who need reteaching. They will record their favorite pattern on Student Resource 11. See Teacher Resource 10 for answers.

For Extension:

Have students create patterns that involve addition or multiplying the number of sides. For example, the teacher could say to the students:

"I start with a triangle. The rule for my pattern will be to add 2 to the number of sides. A triangle has three sides. 3 + 2 = 5. The next shape in my pattern is a 5-sided shape, a pentagon. Now, I add 5 + 2 = 7. The next shape in my pattern is a heptagon since a heptagon has 7 sides. Now, I add 7 + 2 and my answer is 9. The next shape in my paper is a nonagon."

"I will start with a triangle. A triangle has 3 sides. I multiply 3 times 2 and my answer is 6. The next shape in my pattern is a hexagon since it has 6 sides. Now, I multiply 6 times 2 and my answer is 12. A 12-sided shape is called a dodecagon. A dodecagon is the next shape in my pattern.

Have students work in pairs to create shape patterns using addition or multiplication. The students will record their patterns on a dry erase board. Distribute Student Resource 12 to the students working on the extension They will record their favorite pattern on Student Resource 12. See Teacher Resource 11 for answers.

Summative Assessment:

Students have been reintroduced to shapes and their attributes for three consecutive days. Students have worked cooperatively comparing shapes, sorting shapes and creating patterns using 2 –dimensional shapes. To measure students' comprehension of shapes and their attributes, student will be given a summative assessment. Students will be asked to identify and describe various shapes. The summative assessment (Teacher Resource 12, Student Resource 13) will occur following Lesson 3.

To prepare student's for the summative assessment administer "exit tickets" (Teacher Resource 2) to analyze students' knowledge of shape attributes. The exit tickets may be used as closure to the lesson or as a warm-up/drill on Day 2.

During the assessment allow students to use the pattern blocks. This will help student describe shape attributes with ease. This 20 (2 points per question)-point quiz can also serve as a pre-assessment, used to gauge students' ability to identify 2-dimensional shapes, which will help them analyze 3-dimensional shapes in the future.

Authors:

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Shaping Up! Books to Bring Literature to the Lesson!

1. Adler, David & Tobin, Nancy; Shape Up, Holiday House

2. Browne, Anthony; The Shape Game, Farrar, Straus and Giroux (BYR)

3. Dodds, Dayle-Anne & Lacome, Julia; The Shape of Things, Rebound by Sagebrush

4. Falwell, Cathryn; Shape Space, Beacon Press

5.   Hoban, Tonya; Shapes, Shapes, Shapes, Mulberry Publications

6. Metropolitan Museum of Art; Museum Shapes Little Brown

7. Murphy, Chuck; Slide and Sleek Shapes, Simon & Schuster

8. Murphy, Steward, & Miller, Edward; Shape Circus, Harper Trophy

9. Seuss, Dr.; The Shape of Me and Other Stuff, Random House

10. Stelle, Margaret & Estes, Cindy; The Art of Shapes for Children and Adults, Moca Store; Board edition

Shaping Up-Exit Tickets

Shaping Up
Exit Ticket #1

A square has _____.
- ○ Two edges but all are equal
- ○ Four edges, but all are unequal
- ○ **Four equal edges**

Shaping Up
Exit Ticket #2

Cross out the shape that does not belong in the group.
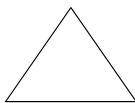
Why did you cross out the shape?

        A square, triangle, and rectangle all have edges. The edges may not all be equal. A circle has no edges and does not belong in the group.

What Shapes Are Inside of This Object?
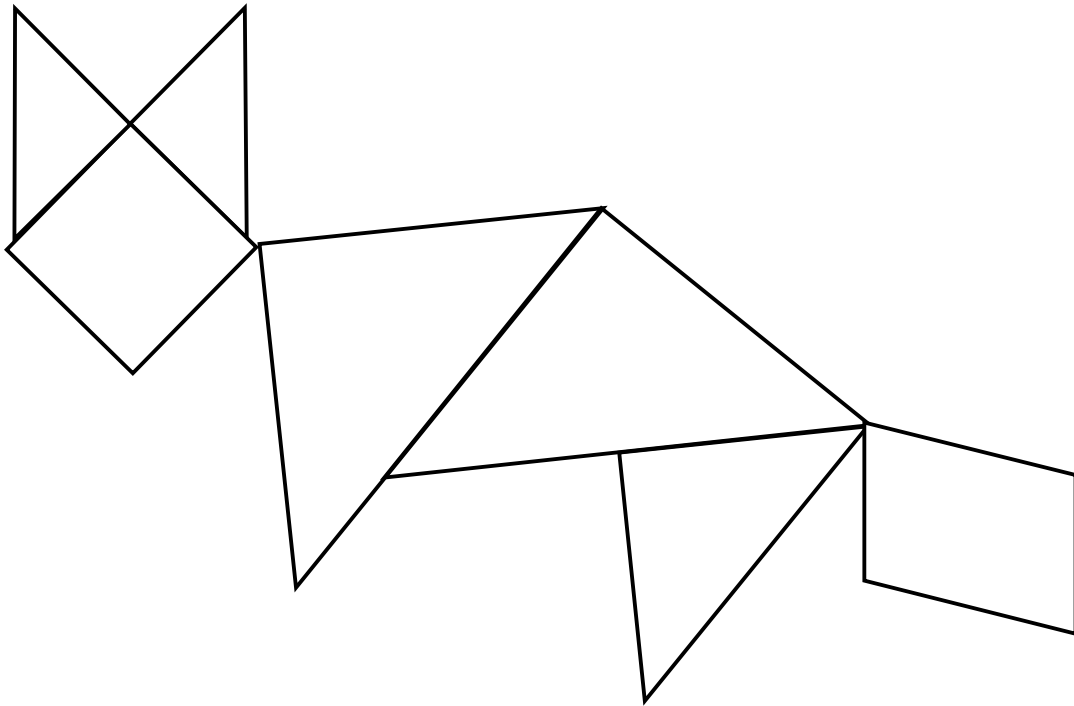
Name:_____

Terrific Tangrams

Today, we read the story <u>Three Pigs, One Wolf, and Seven Magic Shapes</u>. In the book, the author uses tangram shapes to make pictures of things.

Think about your favorite animal. Using the tangram shapes, make a picture of your animal. Trace the shapes into the box below to show the picture of your favorite animal.

Answers will vary.

Example of Possible Answers:

Choose one of the tangram shapes.

I picked a *triangle / parallelogram/ square* _____

        (Triangle, parallelogram, square)

Two attributes for my shape are

<u>*Triangle: 3 sided, 3 vertices*</u>

<u>*Parallelogram: 4 sides, 4 vertices*</u>

Square: 4 equal sides, 4 vertices

Brief Constructed Response

Mike made a picture of a lion using the 2-dimensional shapes below.
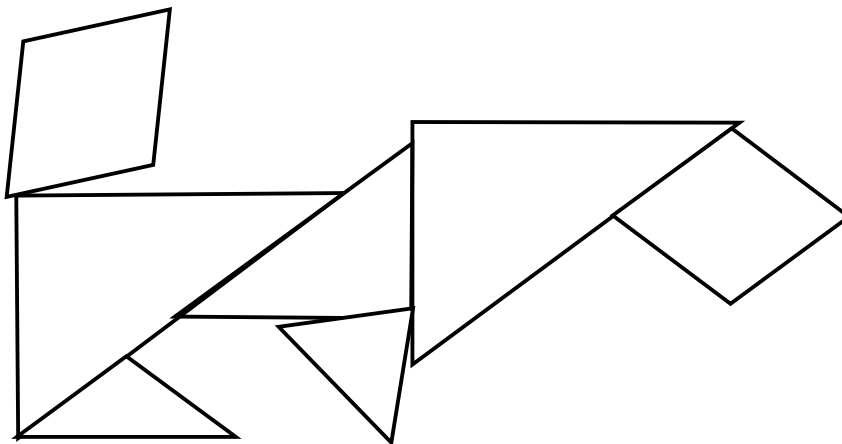
Step A
What 2-dimensial shapes did Mike use to make his picture?

 Parallelogram, triangle, square _____

Step B
Use what you know about geometric shapes to write about the attributes of 2-dimesional shapes Mike used. Use words and/or numbers in your explanation.

Possible Answers:
A parallelogram has equal sides. It has 4 vertices and parallel sides.
A triangle has 3 sides. It has three vertices.
A square has 4 sides. It has equal sides and 4 vertices.

Name:_____

Totally Tangrams

Look at the picture below. Match your tangram shapes to the shapes on the picture below.
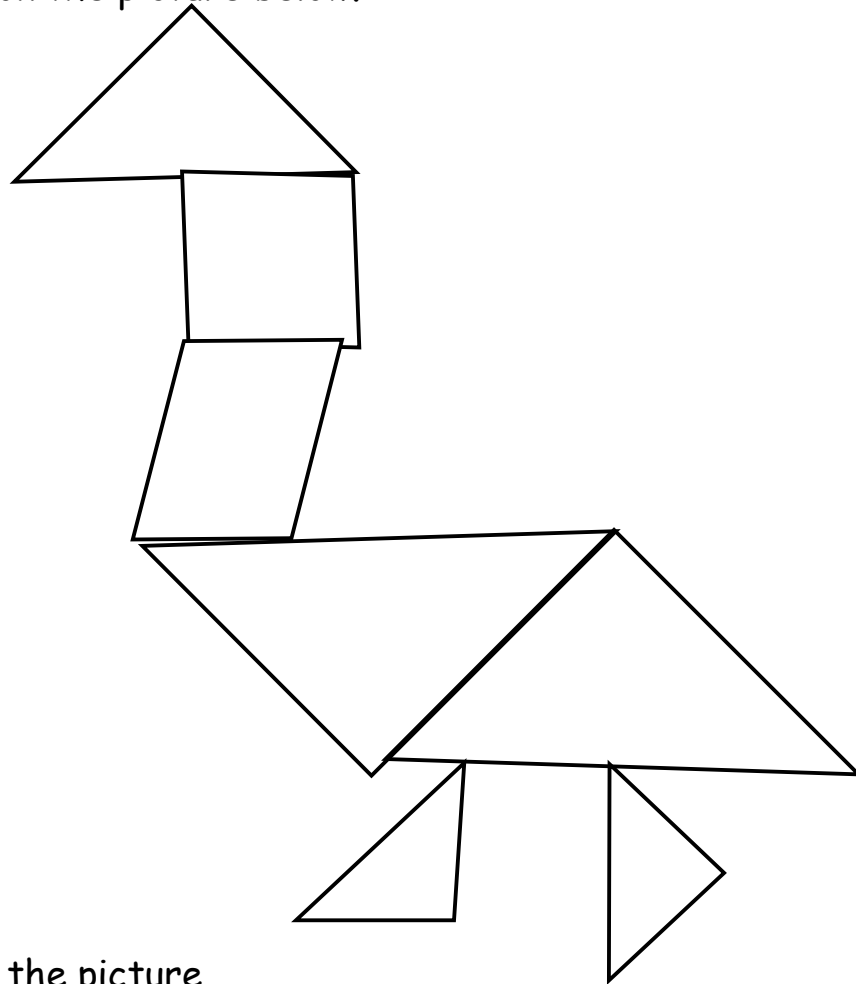
Look at the picture.

Color the triangles red.

A triangle has ___3___ sides.

Color the square blue.

A square has _____4___ sides.

Color the parallelogram green.

A parallelogram has __4___ vertices.

What is this a picture of? _Duck, goose, any reasonable response_

Name:_____

Building With Tangrams

Today, we explored shapes using tangrams. Below, there are the 7 tangram shapes and each shape has been given a point value. You will use the shapes below to design buildings with different point values.

25

5

20

30

10

15

25
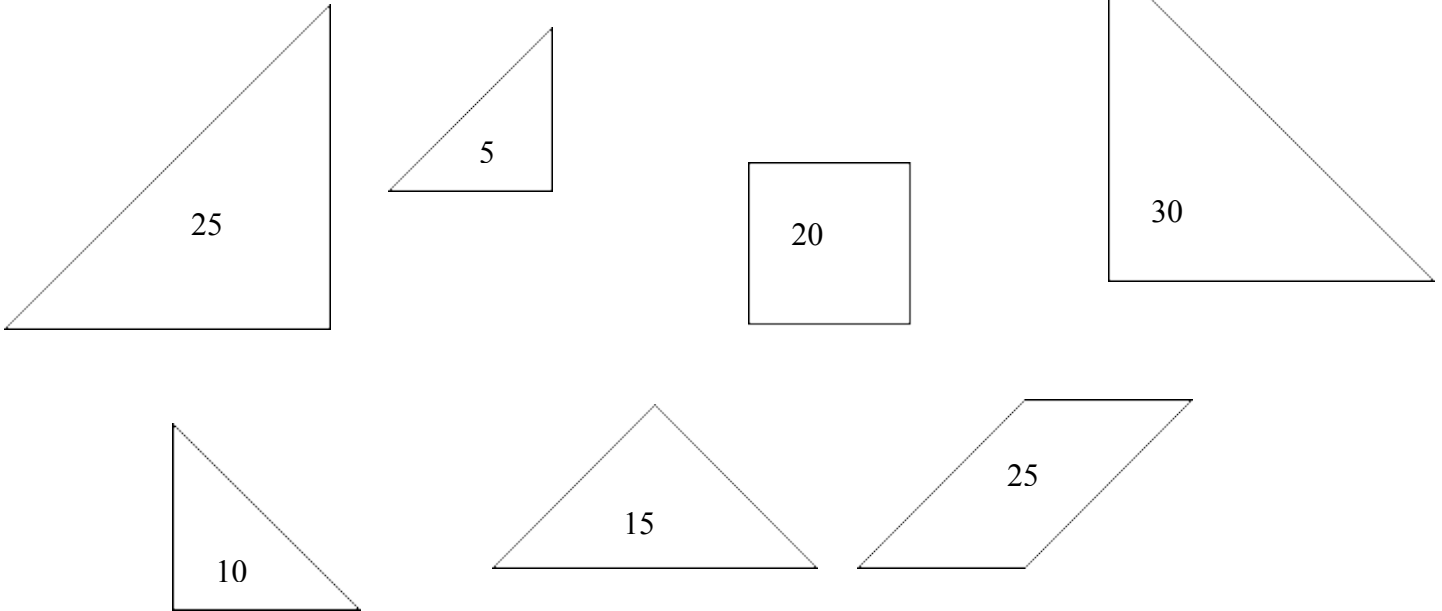
Using your tangram shapes, make a picture of a house that is worth between 50 and 75 points. Draw your house below.

Answers will vary. Any reasonable response is accepted.

My house is worth **_Answers will vary_** _____ points.
Using words and/ or pictures explain how many points your house is worth.

Example of possible response: My house is worth 60 points. First, I used a square. It was worth 20 points. Then, I added a triangle that was worth 15 points. Then, I added a parallelogram. It was worth 25 points. I added 20 + 15 + 25 and my answer was 60.

Using your tangram shapes, design your own building. Draw a picture of your building below.

Answers will vary.   Any reasonable response is accepted.

What type of building did you make? **_Answers will vary.   Any reasonable response is accepted._**
How many points in your building worth? **_Answers will vary.   Any reasonable response is accepted._**
Using words and/ or pictures explain how many points your building is worth.
Example of possible response: I made an ice cream shop that is worth 100 points. First, I used a large triangle. It was worth 25 points. Then, I added two smaller triangles worth 15 points. Then, I added a parallelogram. It was worth 25 points. Last, I added a square. It is worth 20 points. I added 25 + 15 + 15+ 25 + 20 and my answer was 60.

Brief Constructed Response

Nina created a pattern using her shape blocks. This is Nina's pattern:
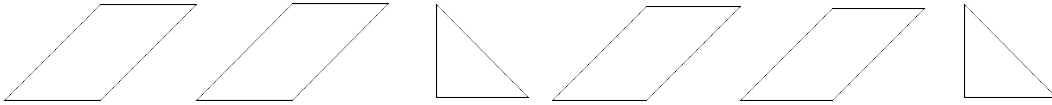
Step A
What shape comes next in Nina's pattern? Write your answer on the line below.

_____***A parallelogram***_____

Step B
Use what you know about <u>*attributes*</u> to explain the rule for Nina's pattern. Use words and/or numbers in your explanation.

A parallelogram has 4 sides and the sides are equal parallel lines.
A triangle has 3 sides and it has 3 vertices.
The rule is a 4 sided shape with equal parallel lines, a 4 sided shape with equal parallel lines, a 3 sided shape, 4 sided shape with equal parallel lines, a 4 sided shape with equal parallel lines, a 3 sided shape,

Name:_____

Patterns! Patterns! Patterns!

Today, we made patterns with shapes. We used **attribute** words to state the rules for the patterns. <u>EXAMPLE</u>:
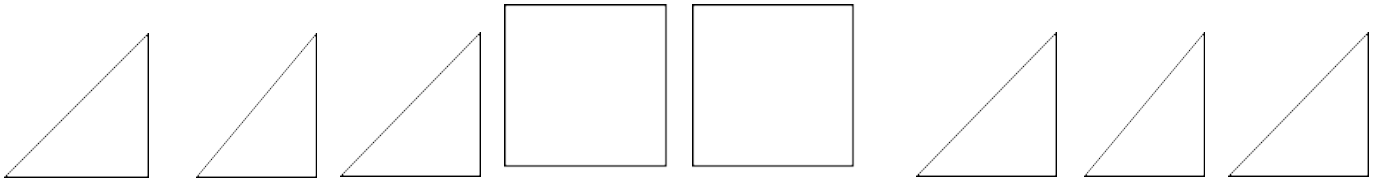
<u>The attribute rule is: 3 sided shape, 3 sided shape, 3 sided shape, 4 sided shape, 4 sided shape, 3 sided shape, 3 sided shape, 3 sided shape</u>

Draw a pattern using shapes below.

Answers will vary. Any reasonable response is accepted.
Example of possible answer: triangle, triangle, square, triangle, triangle, square

Write the rule for the pattern using attribute words.

<u>*Example of possible answer: 3 sided, 3 sided, 4 sided, 3 sided, 3 sided, 4 sided*</u>

Draw another pattern using shapes below.

Answers will vary. Any reasonable response is accepted.
Example of possible answer: triangle, square, hexagon, triangle, square, hexagon

Write the rule for the pattern using attribute words.
<u>*Example of possible answer: 3 sided, 4 sided, 6 sided, 3 sided, 4 sided, 6 sided*</u>

Name:_____

SHAPE PATTERNS
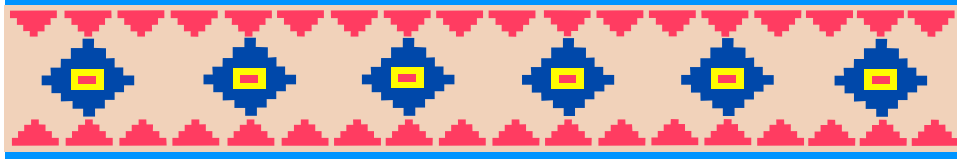
Today, you made patterns using shapes. In the box below, please record the favorite pattern that you made.

Answers will vary. Any reasonable response is accepted.

What shape comes next in your pattern? Draw the shape below.

Answers will vary. Any reasonable response is accepted.

Write one attribute to describe the shape you drew.

Example of Possible Responses: A triangle has 3 sides. A square has 4 sides. A hexagon has 6 vertices.

Name:_____

MULTIPLYING AND ADDING SHAPE PATTERNS
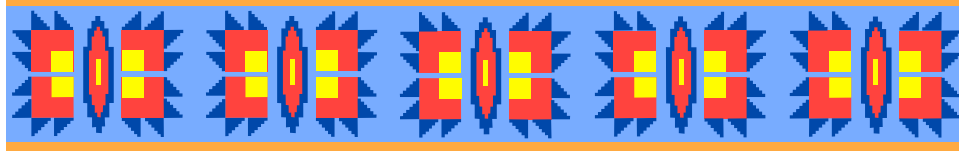
Today, you made patterns using shapes.   We created the rules for the patterns by adding or multiplying by a number of sides. In the box below, please record the favorite multiplying or adding shape pattern that you made.

Answers will vary. Any reasonable response accepted.

EXAMPLE OF A POSSIBLE ANSWER:
  Square, Octagon, Undecagon

Use what you know about multiplication or addition to explain the pattern rule. Use words and/or numbers to explain your answer. *Possible Response: My rule is add 4 sides. First, I started with a square. A square has 4 sides. I added 4 sides to the square and I got 8 sides. An eight-sided shape is an octagon. Next, I added 4 sided to the octagon. 8 + 4 = 11. The third shape in my pattern has 11 sides. It is an undecagon.*

Name_____Date _____

Shaping Up- Exploring the Attributes of Shapes all around Us

Summative Assessment

Directions- Identify attributes of the following shapes.

1. **A circle has _____.**

   ○ Two edges that are all equal

   ○ **No edges**

   ○ Four edges that are all equal

2. **What are attributes of a square?**

   ○ Two edges, but they are not always equal.

   ○ **Four edges that are equal**

   ○ None of the edges are equal

3. **Name the shape with four edges; two edges are longer than the others.**

   ○ Circle

   ○ Triangle

   ○ **Rectangle**

4. Compare the following shapes using the Venn diagram.

| Triangle | | Rectangle |
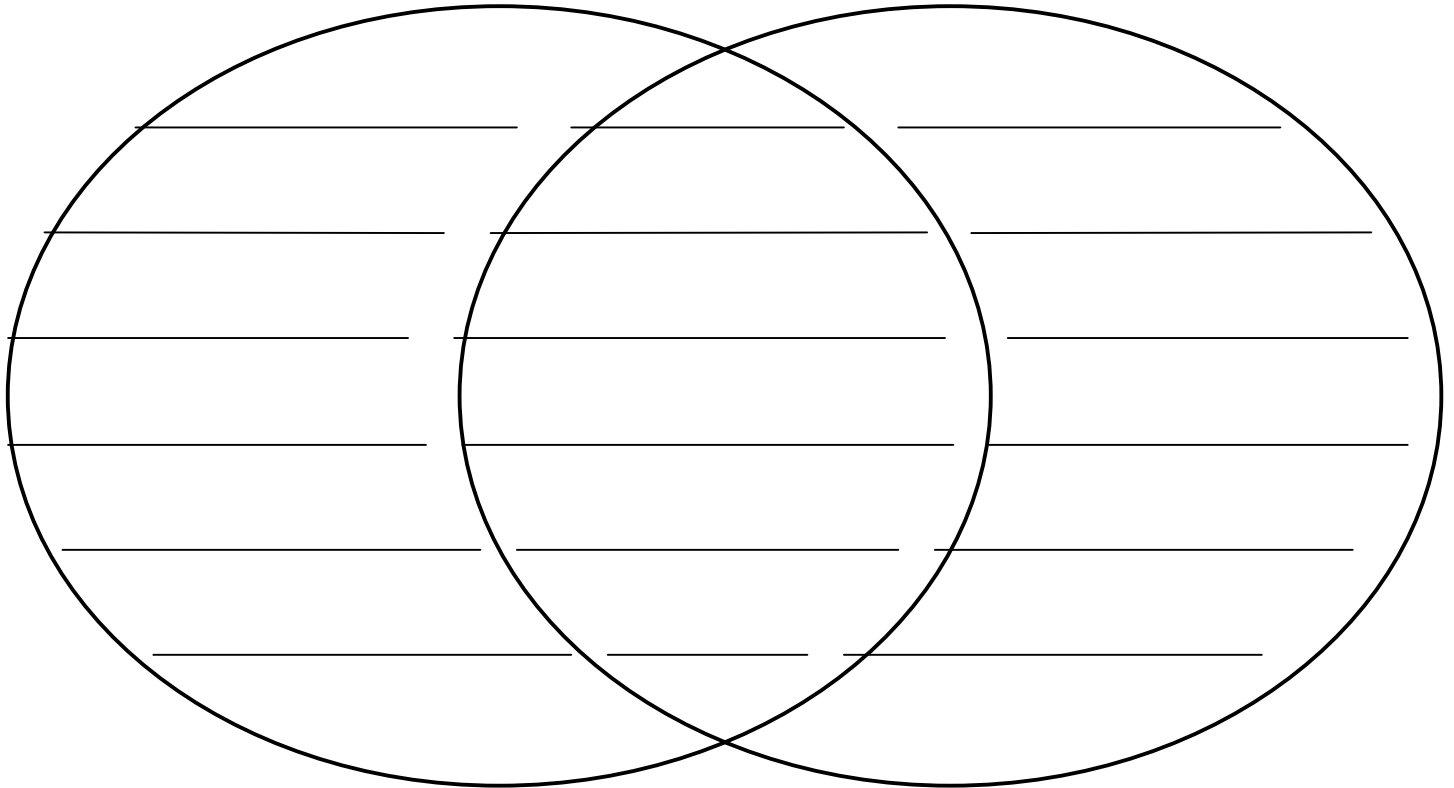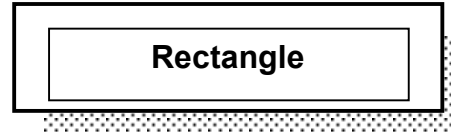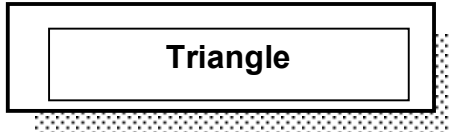
Possible answers:

Triangle-
- Three sides

Rectangle
- Four sides

Both
- All of their sides are not equal.

Shaping Up- Exploring the Attributes of Shapes all around Us

Summative Assessment

5. **Which shapes have three or more vertices?**

    ○ Circle and square

    ○ Triangle and circle

    ○ **Triangle and trapezoid**

6. **What are the attributes of a hexagon? Use your math vocabulary to describe the shape.**

    Possible answer: *If a student lists one attribute to describe a hexagon please give 2 points.*

    A hexagon is a shape that has 6 edges (sides), 6 vertices (points).

7. **How is a hexagon different from a trapezoid? How are the shapes alike?**

    Possible answer: *If a student lists one attribute to describe a difference and similarity please give 2 points.*

    A hexagon is different from a trapezoid because a hexagon has 6 sides and a trapezoid has 4 sides. Trapezoids have four vertices and hexagons have 6 vertices
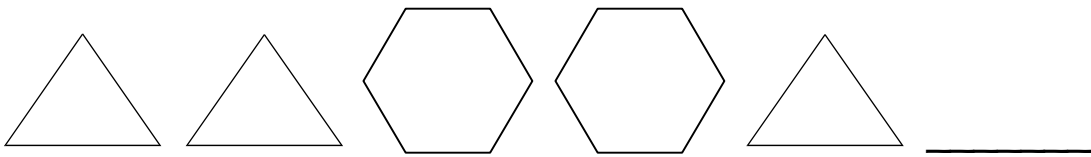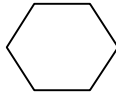
8. **What comes next in the pattern?**

△ △ ⬡ ⬡ △ ___

○   ⬡

○   ▲

○   ⬭

9. Use the tangrams to build a shape with a value greater than 35.

20

30

10

15

5
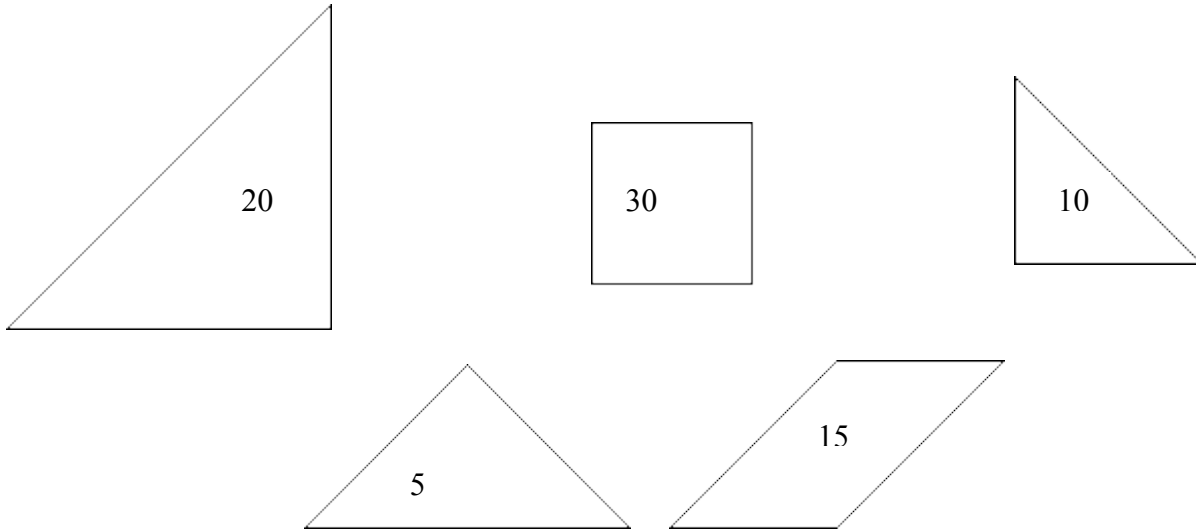
Draw a picture of the shapes used. Add your shapes to find the sum.

Show your work here
Possible answers
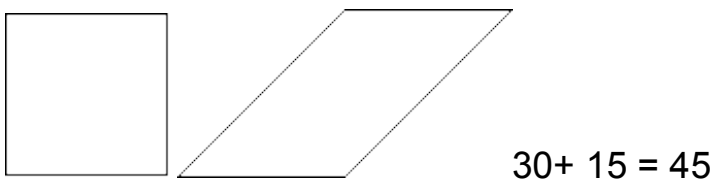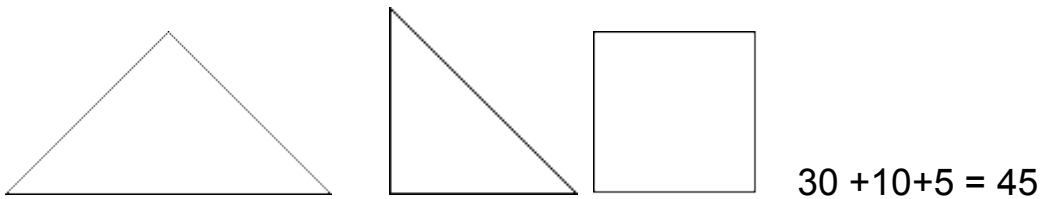
30 +10+5 = 45

30+ 15 = 45

10. **Brief Constructed Response**

Elizabeth made a dog using 2-dimensional shapes.
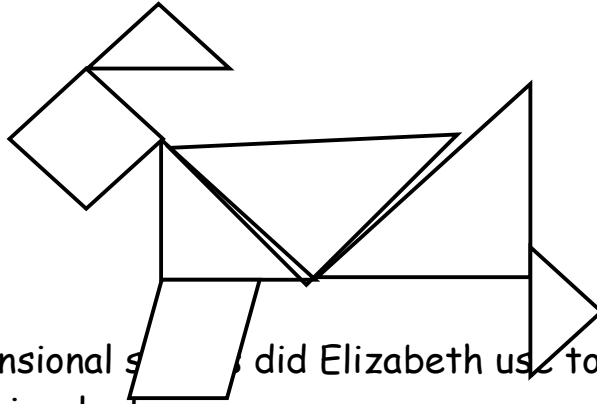
Step A

What 2-dimensional shapes did Elizabeth use to make the dog?

  _square, triangle, hexagon___

Step B

Use what you know about geometric shapes to explain two shapes Elizabeth used. Be sure to write attributes to describe the shapes. Use words and/or numbers in your explanation.

Here is an example of a possible answer.

Elizabeth used triangle in her picture. A triangle is a shape

that has three sides. All the sides of a triangle are not equal.

Elizabeth also used square in her picture. A square is a shape

that has four equal edges. A square and a triangle are alike

because they have edges that are equal.

I'm *round* you see
You'll find *no edges* on me!
I'm a circle.

I have *four edges* (sides)
We're all the same.
You can call us *the equals*.
Square is the name.
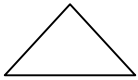
I'm a triangle.
I can be tall and wide
You can find three *edges* on me,
but we're not always *equal in size*.
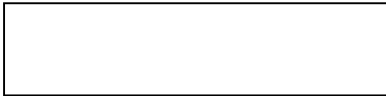
I'm a rectangle
Some say I'm cousin to the square
I have *equal edges*,
But we come in pairs.

Shaping Up
Exit Ticket #1

A square has _____.

○ Two edges but all are equal

○ Four edges, but all are unequal

○ Four equal edges

Shaping Up
Exit Ticket #2

Cross out the shape that does not belong in the group.
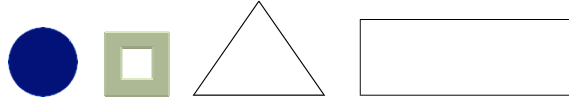
Why did you cross out the shape?

_____

_____

Name_____ **Date** _____

Going on a Shape Shuttle!

Traveling through a shape shuttle here we go!
How many shapes will we find, we don't even know!
A square, triangle, circles and more
Head home to find shapes.
It's time to explore!

Directions:

Find as many as shapes as you can in your home.
- Write the name of the object. Draw a picture of the object.
- Write the name of the shape the object
- Describe the attributes of the shape.

What I found in my home… Draw a picture	The shape it looks like…	Describe the shape (attributes).
My bed	A rectangle	Four edges, but all sides are not equal

Going on a Shape Shuttle!

Connect the dots to discover your shape shuttle.

G●

F●   ●H

Co ●E   ●21   ●I   ●M

D   J●L   ●N
B● ●20   ●22
              ●12

19●   ●11

                ●K
18●   ●10
A●   ●9
                ●O

14●   ●3   ●13   ●8
17●

15●   ●6   ●7
16●   2
1●   ●5
      4
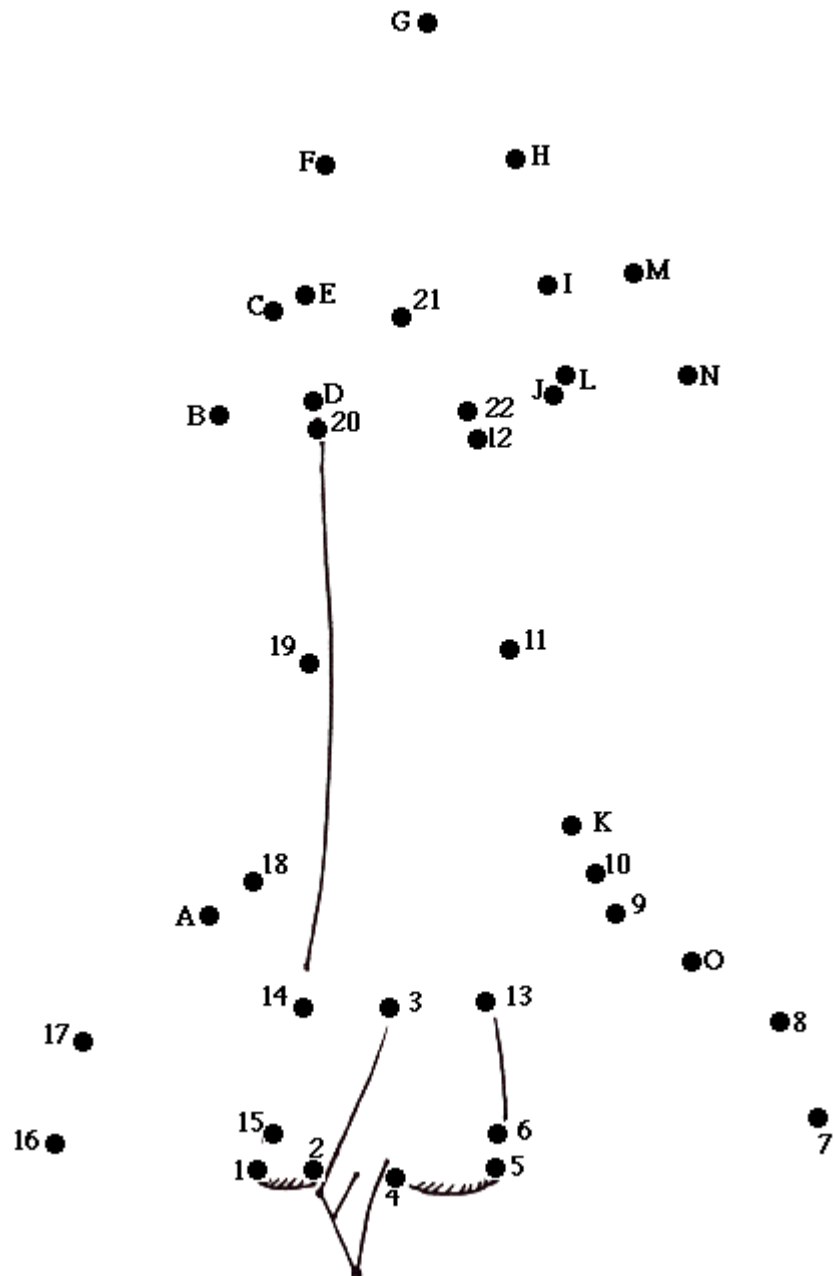
Tangram Fun

Please cut out the shapes below. There are 5 triangles, 1 square, and 1 parallelgram to cut out.
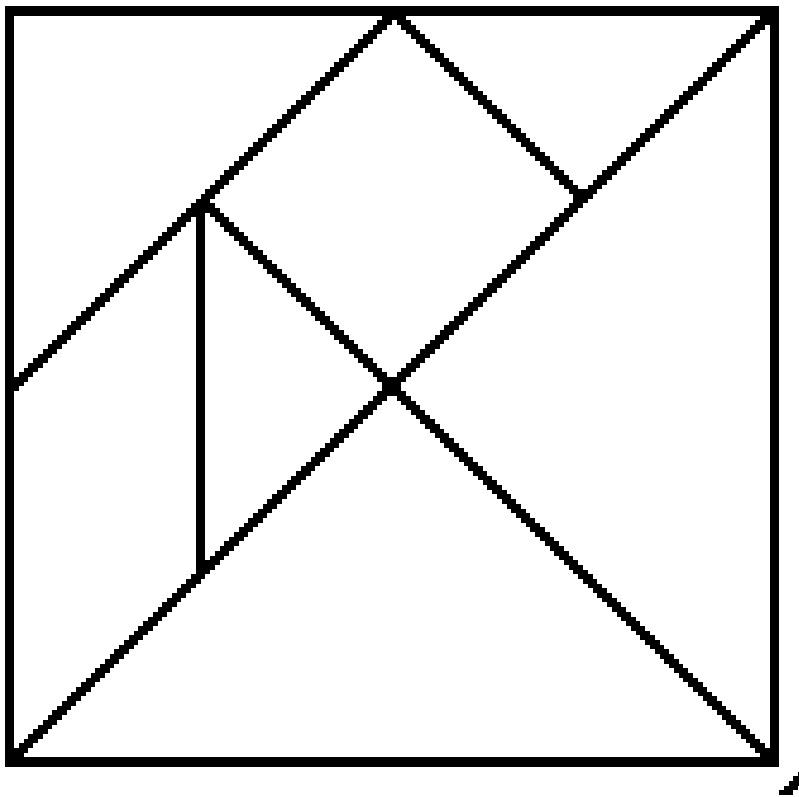
Name:_____

Terrific Tangrams

Today, we read the story <u>Three Pigs, One Wolf, and Seven Magic Shapes</u>. In the book, the author uses tangram shapes to make pictures of things.

Think about your favorite animal. Using the tangram shapes, make a picture of your animal. Trace the shapes into the box below to show the picture of your favorite animal.

```



```

Choose one of the tangram shapes.
I picked a _____
         (triangle, parallelogram, square)

Two attributes for my shape are _____
_____

Brief Constructed Response

Mike made a picture of a lion using the 2-dimensional shapes below.
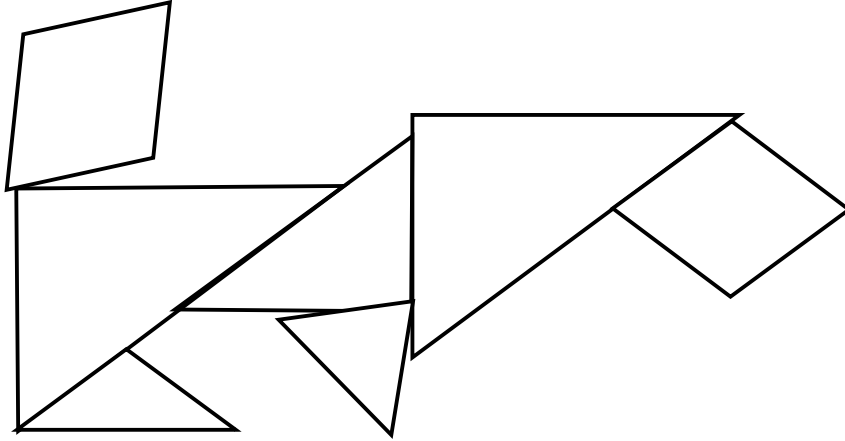
Step A
What 2-dimensial shapes did Mike use to make his picture?

_____

Step B
Use what you know about geometric shapes to write about the attributes of 2-dimesional shapes Mike used. Use words and/or numbers in your explanation.

_____

_____

_____

_____

_____

Name:_____

Totally Tangrams

Look at the picture below. Match your tangram shapes to the shapes on the picture below.
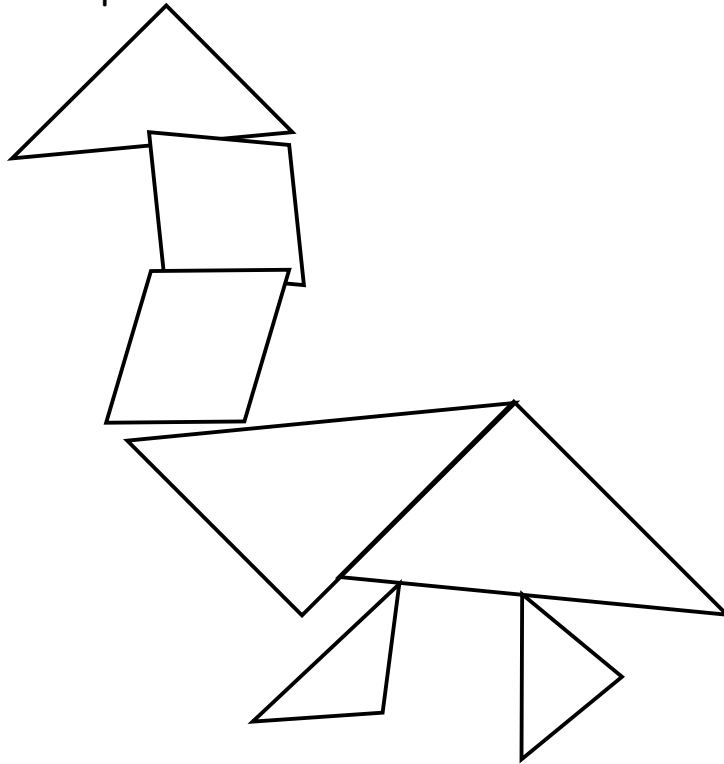
Look at the picture.
Color the triangles red.
A triangle has _____sides.
Color the square blue.
A square has _____sides.
Color the parallelogram green.
A parallelogram has _____vertices.
What is this a picture of?_____

Name:_____

Building With Tangrams

Today, we explored shapes using tangrams. Below, there are the 7 tangram shapes and each shape has been given a point value. You will use the shapes below to design buildings with different point values.

5

25

20

30

10

15

25
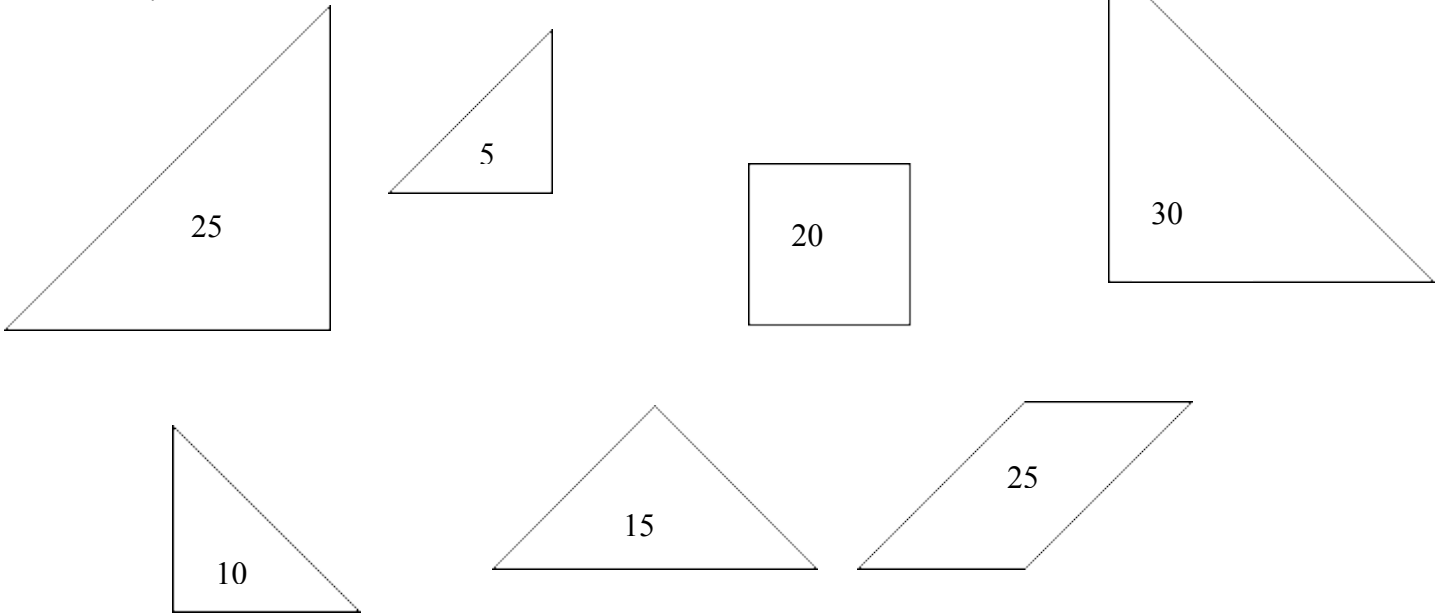
Using your tangram shapes, make a picture of a house that is worth between 50 and 75 points. Draw your house below.

My house is worth _____ points.

Using words and/ or pictures explain how many points your house is worth.

_____

_____

Using your tangram shapes, design your own building. Draw a picture of your building below.

What type of building did you make?_____
How many points in your building worth?_____
Using words and/ or pictures explain how many points your building is worth.

Brief Constructed Response

Nina created a pattern using her shape blocks. This is Nina's pattern:
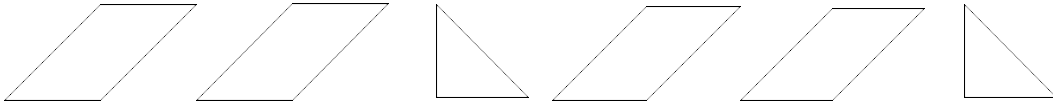
Step A
What shape comes next in Nina's pattern? Write your answer on the line below.

_____

Step B
Use what you know about _attributes_ to explain the rule for Nina's pattern. Use words and/or numbers in your explanation.

_____

_____

_____

_____

_____

Name:_____

Patterns! Patterns! Patterns!

Today, we made patterns with shapes. We used **attribute** words to state the rules for the patterns.

<u>EXAMPLE</u>:
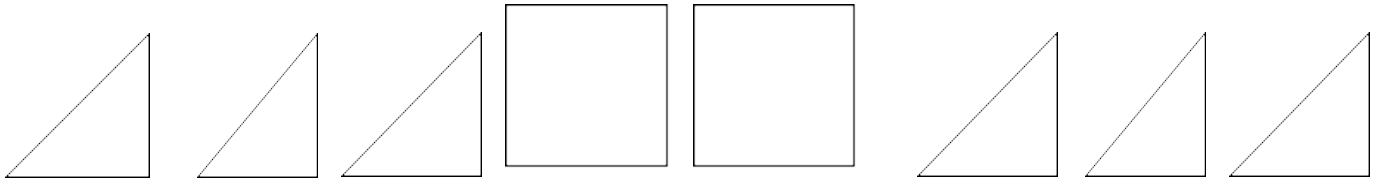
<u>The attribute rule is: 3 sided shape, 3 sided shape, 3 sided shape, 4 sided shape, 4 sided shape, 3 sided shape, 3 sided shape, 3 sided shape</u>

Draw a pattern using shapes below.

Write the rule for the pattern using attribute words.

_____

_____

Draw another pattern using shapes below.

Write the rule for the pattern using attribute words.

_____

_____

Name:_____

SHAPE PATTERNS
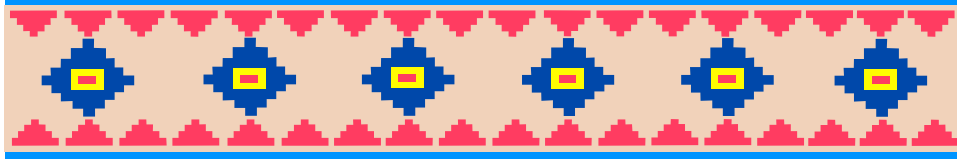
Today, you made patterns using shapes. In the box below, please record the favorite pattern that you made.

What shape comes next in your pattern? Draw the shape below.

Write one attribute to describe the shape you drew.

_____

Name:_____

MULTIPLYING AND ADDING SHAPE PATTERNS
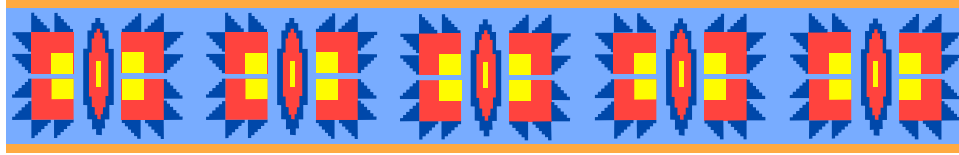
Today, you made patterns using shapes.   We created the rules for the patterns by adding or multiplying by a number of sides. In the box below, please record the favorite multiplying or adding shape pattern that you made.

Use what you know about multiplication or addition to explain the pattern rule. Use words and/or numbers to explain your answer.

Name_____Date _____

Shaping Up- Exploring the Attributes of Shapes all around Us

Summative Assessment

Directions- Identify attributes of the following shapes.

1. **A circle has _____.**

   ○ Two edges that are all equal

   ○ No edges

   ○ Four edges that are all equal
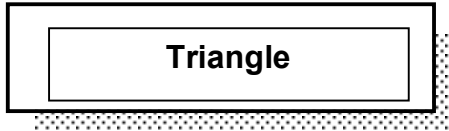
2. **What are attributes of a square?**
   a. Two edges, but they are not always equal.
   b. Four edges that are equal
   c. None of the edges are equal

3. **Name the shape with four edges; two edges are longer than the others.**

   a. Circle
   b. Triangle
   c. Rectangle

4. **Compare the following shapes using the Venn diagram.**
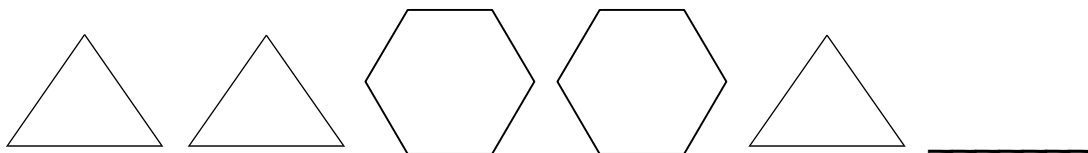
Triangle		Rectangle
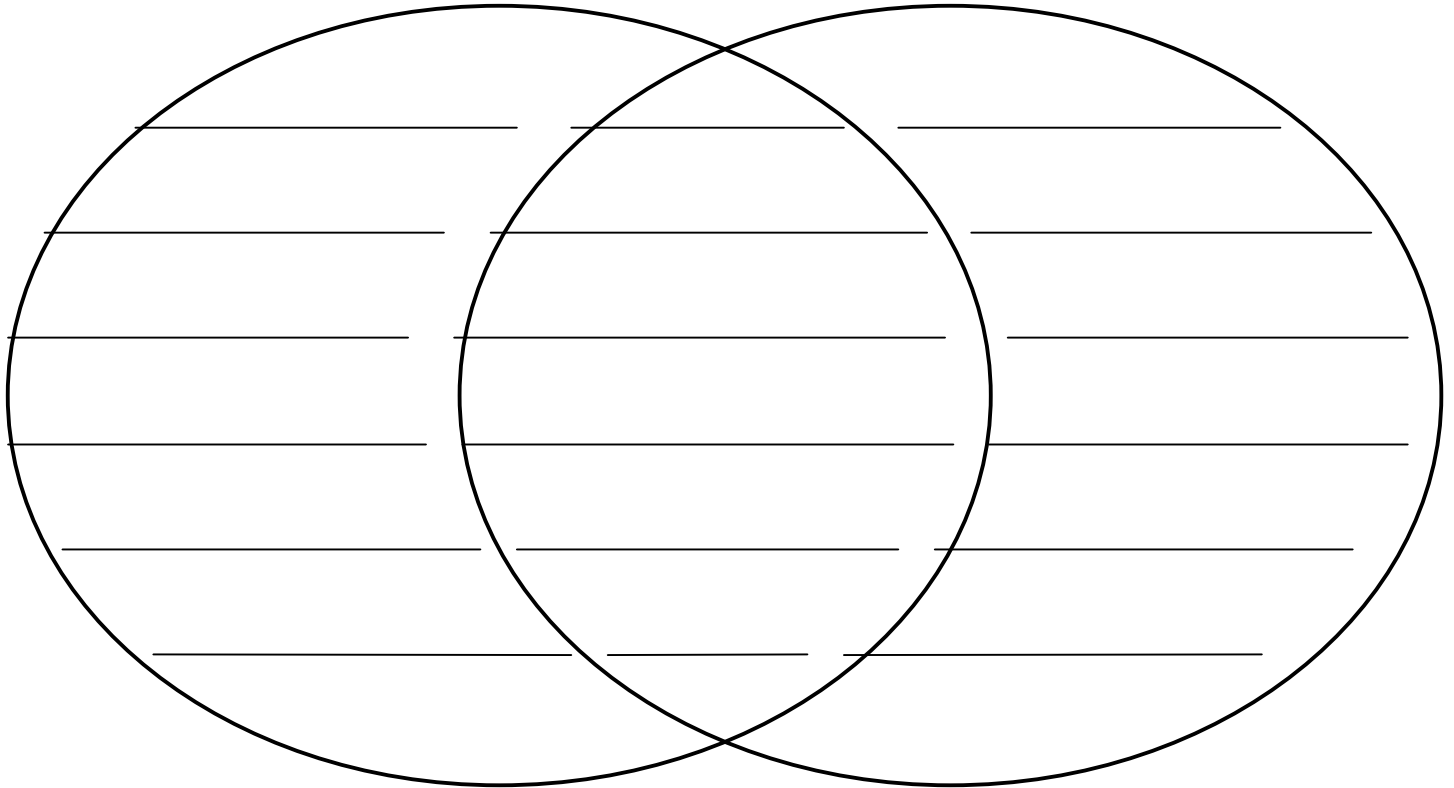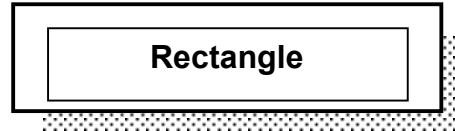
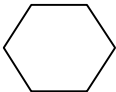5. **Which shapes have three or more vertices?**

    a. Circle and square
    b. Triangle and circle
    c. Triangle and trapezoid

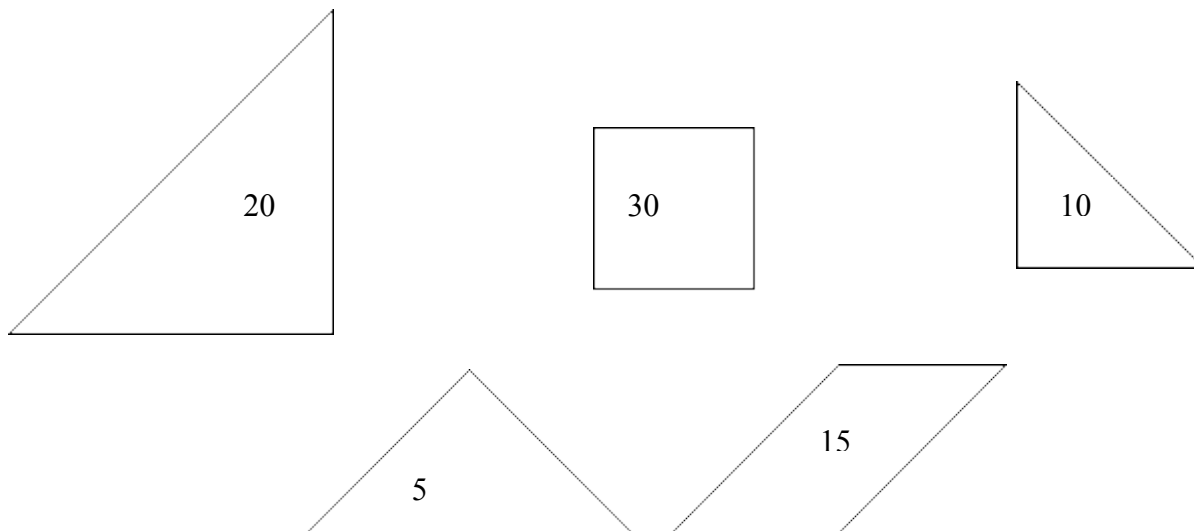6. **What are the attributes of a hexagon? Use your math vocabulary to describe the shape.**

_____

_____

_____

_____

_____

_____

7. **How is a hexagon different from a trapezoid? How are the shapes alike?**

_____

_____

_____

_____

_____

_____

8. **What comes next in the pattern?**

△ △ ⬡ ⬡ △ ____

○   ⬡

○   △

○   ⬭

9. Use the tangrams to build a shape with a value greater than 35.
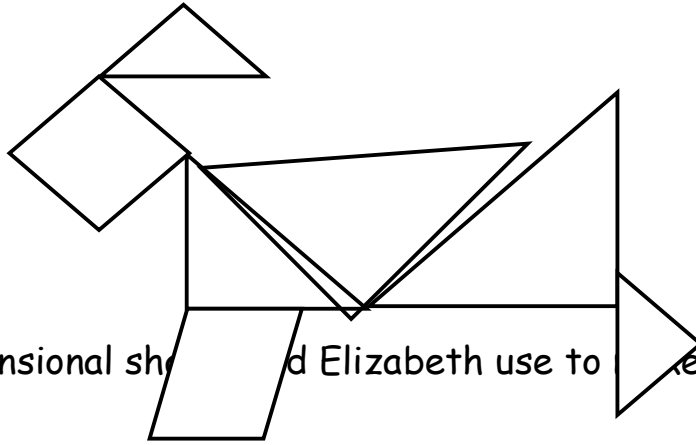
20

30

10

5

15

Draw a picture of the shapes used. Add your shapes to find the sum.

Show your work here

10.

Brief Constructed Response
Elizabeth made a dog using 2-dimensional shapes.

Step A

What 2-dimensional sh_____d Elizabeth use to ____e the dog?

_____

Step B

Use what you know about geometric shapes to explain two shapes
Elizabeth used. Be sure to write attributes to describe the
shapes. Use words and/or numbers in your explanation.

_____

_____